

Patent claims

1. Method for delivering multi-phase mixtures, in particular hydrocarbons from a well, with a displacement pump (1) through which the multi-phase mixture is pumped, characterized in that a partial liquid flow (13) is split off on the pressure side from the main delivery flow and guided to the high-pressure side of at least one ejector pump (2) arranged on the suction side of the displacement pump (1) as an auxiliary delivery device.
2. Method according to claim 1, characterized in that the ejector pump (2) is arranged in or on the well (3).
3. Method according to claim 1 or 2, characterized in that a separation of gas phase and liquid phase is carried out in the displacement pump (1), and the partial liquid flow (13) to the ejector pump (2) is split off from the separated liquid phase.
4. Method according to claim 3, characterized in that a partial volume flow of the separated liquid phase is fed in a portioned manner to the suction side of the displacement pump (1) via a short-circuited line (15).
5. Method according to one of the preceding claims, characterized in that after the partial liquid flow (3) has been split off, this flow is guided through an additional separator (4) for dividing gas phase from liquid phase.
6. Method according to one of the preceding claims, characterized in that the delivery pressure is increased between the displacement pump (1) and the ejector pump (2) by a booster pump (5).
7. Pump installation with a displacement pump (1) for delivering multi-phase mixtures with a suction line (10) and a pressure chamber, whereby the suction line (10) discharges in particular into a well, characterized in that a feed line (7) connects the pressure chamber of the displacement pump (1) with the high-pressure side of at least one ejector pump (2), and the

ejector pump (2) is arranged on the suction side in the delivery direction of the displacement pump (1).

8. Pump installation according to claim 7, characterized in that the ejector pump (2) is arranged in the area of discharge of the suction line (10) into the well (3) in the delivery direction of the displacement pump (1).
9. Pump installation according to claim 7 or 8, characterized in that separation devices are embodied within the displacement pump housing to divide gas phase from liquid phase in the pressure chamber.
10. Pump installation according to one of claims 7 through 9, characterized in that a short-circuited line (15) leads from the pressure-chamber side to the suction side of the displacement pump (1) for the portioned feeding of the separated liquid phase.
11. Pump installation according to one of claims 7 through 10, characterized in that an additional separator (4) is arranged in the feed line (7) for dividing the liquid phase from the gas phase.
12. Pump installation according claim 11, characterized in that a return line (14) leads from the additional separator (4) to the pressure line (11) of the displacement pump (1).
13. Pump installation according to one of claims 7 through 12, characterized in that a booster pump (5) is arranged in the feed line (7).
14. Pump installation according to one of claims 7 through 13, characterized in that the displacement pump (1) is embodied as a screw pump.
15. Pump installation according to one of claims 7 through 14, characterized in that the ejector pump (2) is arranged in or on the well (3), in particular at the end of the suction line (10).